Chapter 9

Transportation

TRANSPORTATION: INTRODUCTION

The Greensboro Department of Transportation (GDOT) provides transportation services to Greensboro citizens through five divisions: Business/ Parking, Public Transportation, Engineering, Planning, and Operations. Among its responsibilities, GDOT studies and manages traffic in the City of Greensboro.

The Piedmont Triad International Airport (PTIA), located eight miles west of Greensboro's downtown area, is one of the major commercial and private aviation centers in the southeast. It is owned and operated by the Piedmont Triad International Airport Authority. American, Continental, Delta, United, US Airways, AirTran, Northwest, and Air Canada provide scheduled passenger service. Shuttle America, American Eagle, ASA, Comair, United Express, Piedmont Airlines, and USAir Express offer commuter service. In calendar year 1999, approximately 85 scheduled daily flights handled over 1.35 million departing passengers.

This chapter describes the operations of the five GDOT divisions, thoroughfare and intersection congestion, parking, the PTIA, and the various transportation modes used by the citizens of Greensboro and selected comparison areas.

TRANSPORTATION: SUMMARY HIGHLIGHTS

Public Transit

Between FY 1995-96 and FY 2000-2001, ridership on the Greensboro Transit System increased from 1,769,943 to 2,021,074 (14.2 percent). Fixed Route ridership also increased, from 1,666,811 to 1,865,878 (11.9 percent).

Between FY 1997-1998 and FY 2000-2001, total Flex Route services increased from 15,710 to 60,608, which was a 286 percent increase in ridership.

Fixed, Flex and Demand Response (SCAT) hours are important yardsticks in measuring system effectiveness. From FY 1995-1996 to FY 2000-2001, Fixed Route hours increased by 35 percent. Fixed Route riders per hour declined from 23.71 to 19.66. From FY 1997-1998 to FY 2000-2001, Flex Route hours increased from 4,635 to 7,560, an increase of 63 percent, with an increase in riders per hour from 3.40 to 8.02. Demand Response hours increased by 1 percent from fiscal years 1995-1996 to 2000-2001 with riders per hour declining as well, from 2.84 to 2.59.

Between FY 1995-1996 and FY 1999-2000, Greensboro's per capita total system ridership experienced a 13.6 percent decrease. This indicates that a smaller percentage of the population is using mass transit. The percentage of the population who is using mass transit is also using it more often. FY 1999-2000 per capita total ridership was 7.88.

Downtown Parking

Greensboro's Central Business District (CBD) has approximately 4,280 public parking spaces in the following locations: 2,821 in decks, 670 in on-street metered and 331 on-street un-metered (time zone), and 458 in seven surface lots.

Traffic Congestion

The citizens of Greensboro recently passed a $71.75 million bond package for transportation improvements in Greensboro to be spent over the next ten years, including $51.5 million for roadway expansions and widening. Many of the roadway expansion and/or widening projects included in the bond package are State system streets that NCDOT does not plan to improve in the near future. See map for City and State roadway improvements planned through 2025.

The two congestion tables and maps in this chapter illustrate the severe traffic flow problems at selected intersections and along selected street segments in Greensboro. Congested intersections increased from 21 in 1990 to 98 in 2000. Similarly, congested arterials rose from eight miles in 1990 to 40 miles in 2000.

Between 1989 and 1999 during a.m. and p.m. peak travel times, the top ten congested Greensboro City thoroughfares had a Level of Service (LOS) F. Level F is the lowest level of service and defined as extremely slow with extreme delay (less than 25 percent of the free flow speed).

In 1999, Greensboro's top 25 highest average daily traffic intersections were also classified at Level of Service (LOS) F. LOS F for intersections indicates an average delay of less than 80 seconds per vehicle.

Mode Share

In 1990, driving alone was the principal mode of travel in Greensboro, followed by carpooling and walking. Greensboro citizens were also driving alone at a higher level than the nation. Citizens used public transportation at a level much lower than that of the United States, but higher than North Carolina overall. Traffic congestion is a major quality of life issue in most communities, including Greensboro. Increased multi-modal use, flexible work schedules, telecommuting, and infill development, in combination with roadway widening will be needed to maintain an overall level of traffic congestion that is acceptable to the citizens of Greensboro.

Airport

The City of Greensboro's transportation needs are also served by the Piedmont Triad International Airport (PTIA). Aircraft operations and the number of passengers flying out of Piedmont Triad International Airport increased from 1996-2000, by 5.6 percent and 7.5 percent respectively. Total cargo poundage carried (US mail, and express/ freight) declined 7.0 percent.

The average number of flights per day at the Piedmont Triad International Airport began with 62 in 1993, increased steadily to the peak year of 1994 (149), and has averaged 79 flights per day between 1996 and 1999. The diminishing number of flights was caused mainly by the loss of the hubs of various airlines including Continental, Tradewinds and Eastwinds.

TRANSPORTATION OPERATIONS

The transportation services provided by the Greensboro Department of Transportation (GDOT) to Greensboro citizens include public transit, parking, bikeways, transportation planning, sidewalks, traffic signals and signs, street lighting, the storm drainage system, street repair and cleaning, loose-leaf removal, and snow and ice removal.

The following is a description of those services.

Transit System

The Greensboro Transit Authority (GTA) provides Fixed Route, Specialized Community Area Transportation (SCAT) for the disabled, Flex Route Services, and Auxiliary Programs. As of September 30, 2000, Career Express is the only Flex Route still in service. Flex Route Services consist of Late Line, Career Express, and TAG. Auxiliary Programs consist of Adopt-A-Stop, Advertising, Bus Rider Orientation, Community Relations, Corporate Connections, Rack-n-Roll, and Travel Training. Ridership during FY 2000-2001 was 1,865,878 for Fixed Route, 94,588 for Specialized Community Area Transportation (SCAT) and 60,608 for the Flex Route. Service vehicles number 28 for Fixed Route, 26 for SCAT and some of the service vehicles are re-used for Flex Route Services.

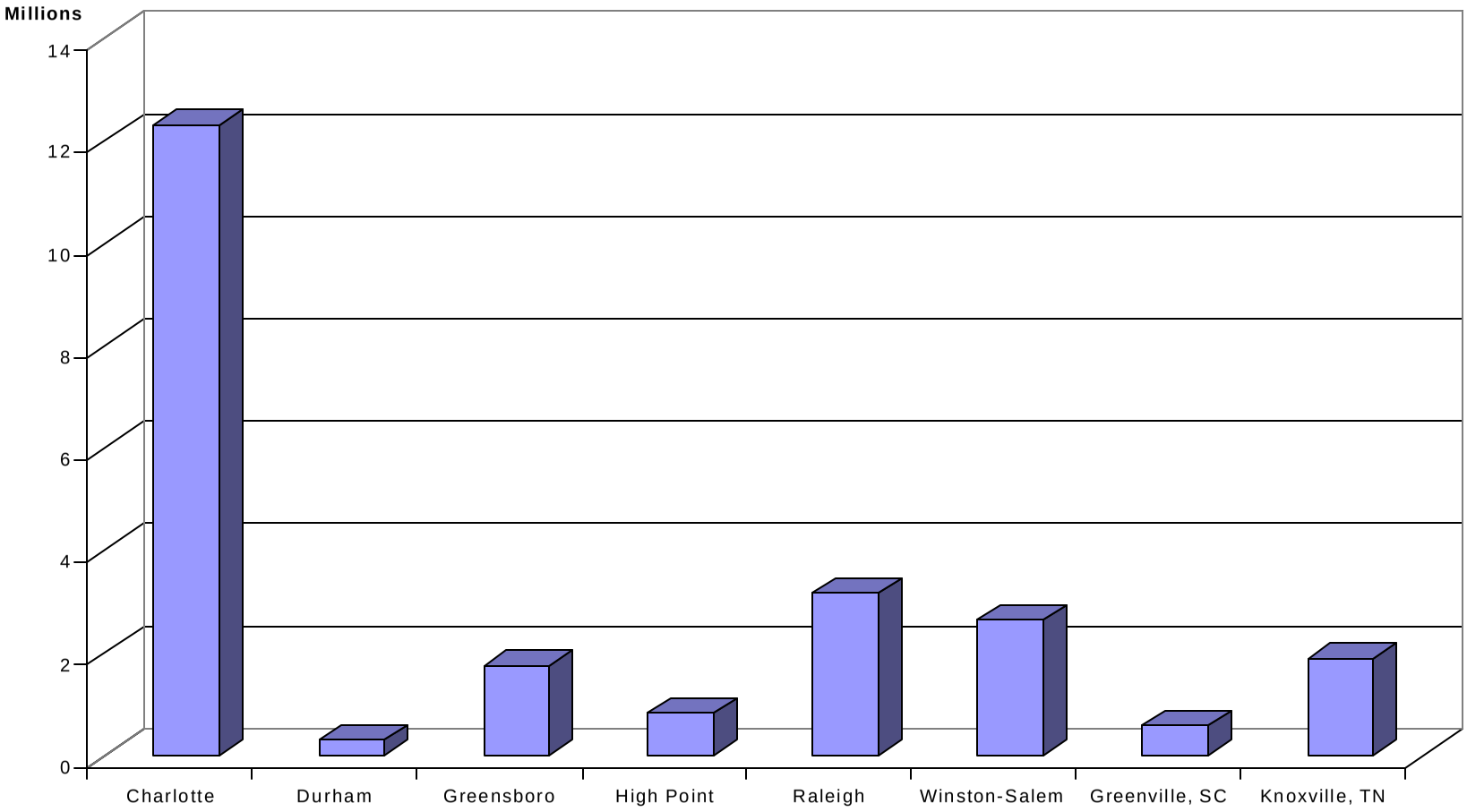
Prior to October 1991, the Duke Power Company operated the bus system under a 50-year franchise agreement. In consideration for being relieved of this obligation, the Company agreed to pay the City of Greensboro $1.5 million annually over the term of 37 years, with 29 years currently remaining. In addition to the annual payment from the Duke Power Company, the City finances the bus system operations with Federal Urban Mass Transit grants, state grants, bus fare revenues, and a special transit tax. Although the City is authorized to levy a special transit tax of up to $.035 per $100 property valuation, the City is currently levying only $.015 per $100 property valuation.

Table 9-1: System-Wide Public Transit Ridership for Selected Municipalities, 1999-2000

NC Municipalities	Total Route Hours	Total Ridership
Charlotte	41,364	12,323,550
Durham	128,943	300,093
Greensboro	112,077	1,763,906
High Point	28,518	831,164
Raleigh	132,198	3,168,642
Winston-Salem	119,264	2,650,760
Out-of-State Municipalities		
Greenville, SC	33,015	578,508
Knoxville, TN	165,286	1,911,695
Montgomery, AL	NA	NA

Source: Greensboro Transportation Dept., 2000.

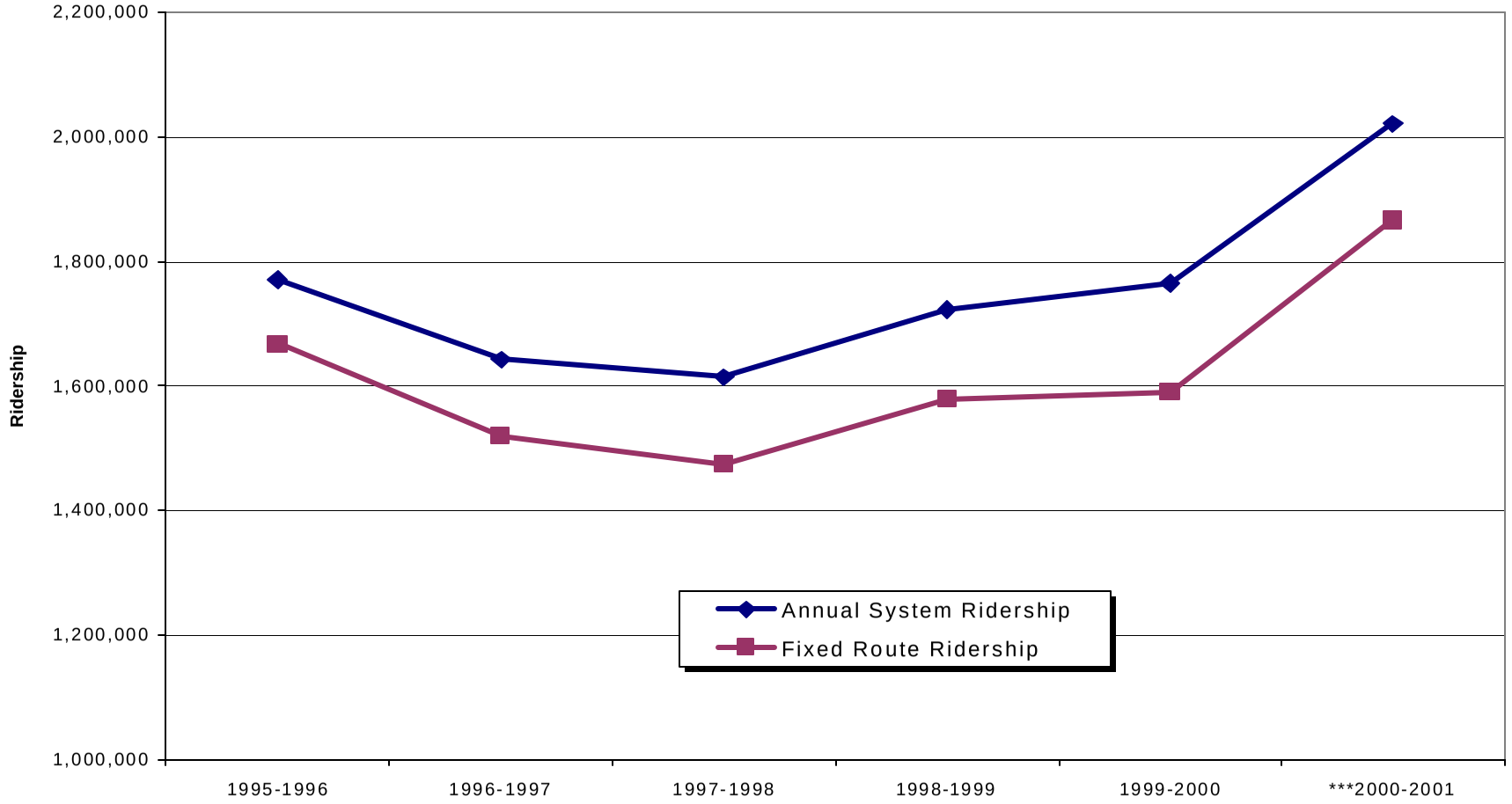
Figure 9-1: System-Wide Public Transit Ridership for Selected Municipalities, 1999-2000



Source: Greensboro Transportation Dept., 2000.

Table 9-2: Greensboro Transit Ridership, 1997-2001						
Type	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	***2000-2001
Annual System Ridership	1,769,943	1,641,525	1,613,413	1,723,079	1,763,906	2,021,074
Fixed Route Hours	70,297	67,932	62,404	63,886	68,387	94,927
Fixed Route Ridership	1,666,811	1,519,958	1,474,339	1,577,975	1,588,762	1,865,878
Fixed Route Riders per Hour	23.71	22.37	23.62	24.69	23.23	19.66
Flex Route Hours	NA	NA	*4,635	**14,546	12,975	7,560
Flex Route Ridership	NA	NA	*15,710	**65,185	96,474	60,608
Flex Route Riders per Hour	NA	NA	*3.40	**4.48	7.44	8.02
Demand Response Hours (SCAT)	36,263	36,392	39,871	26,804	30,715	36,484
Demand Response Ridership (SCAT)	103,132	121,567	123,364	79,919	78,670	94,588
Demand Response Riders per Hour (SCAT)	2.84	3.34	3.09	2.98	2.56	2.59
Source: Greensboro Transit Dept., 2000. *Career Express for the entire FY & TAG & lateline for 2 months of FY. **Career Express & Late-line the entire FY & TAG 6 months of FY. ***Projected for June 2001 (real numbers through May 30, 2001).						

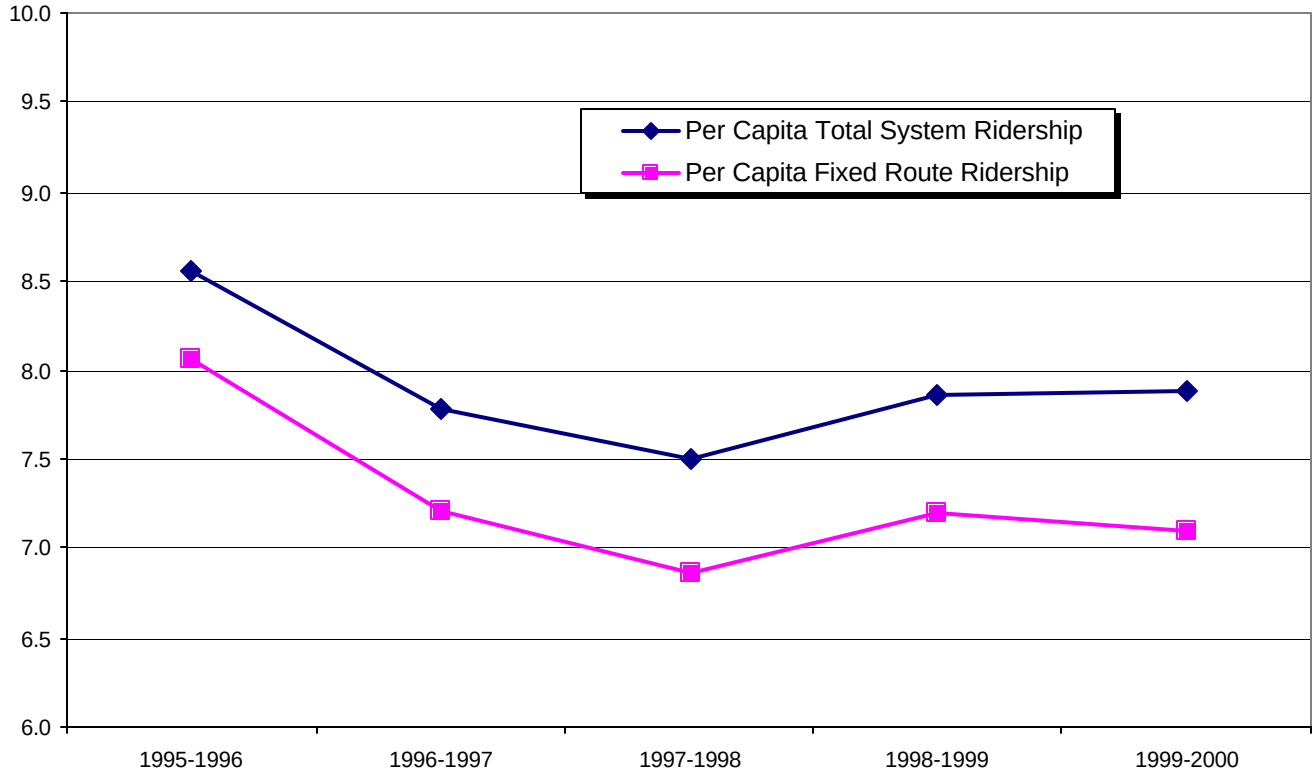
Figure 9-2: Greensboro Transit Ridership, 1997-2001



Source: Greensboro Transportation Dept. *Career Express for the entire FY & TAG and lateline for 2 months of FY. **Career Express & Lateline the entire FY & TAG 6 months of FY. ***Projected for June 2001 (real numbers through May 30, 2001).

Table 9-3: Greensboro Per Capita Transit Ridership, 1995-2000					
Fiscal Year	Greensboro Population	Total System Rider-ship	Per Capita To-tal System Rid-ership	Fixed Route Ridership	Per Capita Fixed Route Ridership
1995-1996	206,798	1,769,943	8.6	1,666,811	8.1
1996-1997	210,886	1,641,525	7.8	1,519,958	7.2
1997-1998	215,055	1,613,413	7.5	1,474,339	6.9
1998-1999	219,224	1,723,079	7.9	1,577,975	7.2
1999-2000	223,891	1,763,906	7.9	1,588,762	7.1
Source: Greensboro Transit Dept., 2000.					

Figure 9-3: Greensboro Per Capita Transit Ridership, 1995-2000



Source: Greensboro Transportation Dept., 2000.

Table 9-4: Greensboro Transit Flex Route Services, 1997-2001				
	1997-98	1998-99	1999-00	2000-01*
LateLine Ridership	4,706	41,876	56,068	**16,472
Career Express Ridership	10,659	22,362	40,406	44,136
Tag Ridership	345	947	0	0
Total	15,710	65,185	96,474	60,608
Source: Greensboro Transit Dept., 2000. *Projected for 2001 (real numbers through May 30, 2001). **Flex Route Service for LateLine ended 9/30/00.				

Parking System

The parking system of the City provides both on- and off-street parking in the central business district (CBD). On-street parking is provided on both a metered and a time zone restricted basis. Surface lots and four parking garages provide off-street parking. The four parking garages provide 2,821 spaces in the CBD, which are supplemented by 1001 on-street metered and time zoned (un-metered) parking spaces, plus several parking lots that provide a combined total of 458 spaces. All together, the City of Greensboro provides 4,280 parking spaces in the CBD.

Table 9-5: Greensboro CBD Parking Facilities, 2001	
Decks	
Davie Street	415
Greene Street	706
Church Street	424
Bellemeade Street	1276
Total	2821
City-Owned Surface Lots	
Elm Street at Greene St.	69
Elm Street at Martin Luther King, Jr. Dr.	27
Summit Avenue	62
Smothers Place at McGee St.	33
Elm Street at McGee St.	73
Federal Place at McGee St.	80
City/County (Land Owned by City)	114
Total	458
On-Street Metered	
Various Streets in CBD	670
On-Street Unmetered	331
Total	1001
Grand Total	4280
Source: Greensboro Transportation Dept., 2001.	

Street System

The City of Greensboro is responsible for the maintenance, expansion, and improvement of the local street system. As of June 30, 2000, this street system includes 873 miles of paved streets and 3 miles of unpaved streets. The North Carolina Department of Transportation (NCDOT) is responsible for the maintenance, expansion and improvements of primary and secondary State system routes within the City of Greensboro. The NCDOT is responsible for 236 miles of streets in Greensboro, including the Interstate system, US-routes, and major State Routes.

The NCDOT focuses mainly on maintaining and improving the interstate highways and major freeways. The majority of the projects identified for funding in the State Transportation Improvement Program (STIP) are major freeway enhancements, such as the Greensboro

Urban Loop, the widening of I-40, US-220, and US-70. The City of Greensboro receives funds annually to maintain, expand and improve city streets from a proportion of the state gasoline tax called the Powell Bill fund.

Powell Bill funds are primarily used to maintain city streets. Periodically, Greensboro voters support roadway bond packages in order to make other improvements to the transportation system, such as widening roads, building sidewalks, and expanding transit service. Funds from the $75 million 1988 transportation bond have nearly been exhausted, and the citizens of Greensboro recently passed a $71.75 million bond package for street improvements in Greensboro to be spent over the next ten years, including $51.5 million for roadway expansions and widening. Many of the roadway expansion and/or widening projects included in the bond package are State system streets that NCDOT does not plan to improve in the near future. See map for City and State roadway improvements planned through 2025.

Roadway improvement projects in Greensboro are determined by examining existing traffic conditions and projected traffic growth and/or patterns. The NCDOT maintains a traffic model that projects future traffic patterns in Greensboro. The model projects traffic patterns through the year 2025, and is based on consultation with the City of Greensboro Departments of Transportation and Planning. The City of Greensboro Department of Transportation conducts a periodic assessment of existing traffic conditions in Greensboro through its "Congestion Management Program". Heavily traveled intersections, arterial streets, and freeways are evaluated periodically to assess the traffic carrying capacity of those facilities. As shown on the 1990 Traffic Congestion map, Greensboro had 21 intersections that the Department of Transportation considered highly congested, and eight miles of congested arterial streets during the a.m. and p.m. peak travel times. As shown on the 2000 Traffic Congestion map, Greensboro had 98 intersections that rated as congested or highly congested, and 40 miles of congested arterial streets during a.m. and p.m. peak travel times.

An intersection is considered to be highly congested if the average vehicle has to wait 80 seconds to travel through the intersection. An arterial street (corridor) is considered to be highly congested if the average travel speed along the arterial including stops at intersections is 68 percent lower than the free flow speed along the corridor without stops.

Traffic congestion is a major quality of life issue in most communities, including Greensboro. Increased multi-modal use, flexible work schedules, telecommuting and infill development, in combination with roadway widening will be needed to maintain an overall level of traffic congestion that is acceptable to the citizens of Greensboro.

Table 9-6: Greensboro's Top 25 Highest Average Daily Traffic Intersections, 1999					
Rank*	Location	V/C Ratio	Percent Annual Growth	Average Daily Traffic	Comments/ Projects
1	Battleground Ave & Westridge Rd	5.878	0.03	53,435	Intersection Improvement Project
2	NC 68 Hwy & Triad Center Dr	4.680	0.04	65,201	Intersection Improvement Project
3	Bryan Blvd & Regional Rd	3.912	0.23	42,832	Regional Study in Progress
4	NC 68 & Pleasant Ridge Rd	3.537	0.39	65,500	Regional Study in Progress
5	NC 68 Hwy & Thorndike Rd	3.439	0.11	45,522	Regional Study in Progress
6	Pomona Dr & Spring Garden St	3.300	0.06	50,881	Project on Hold
7	Dudley St & Market St	3.203	0.03	51,517	Signal Modification
8	Green Valley Rd & Market St	2.916	0.03	28,954	No Project
9	Benjamin Pwy & Pembroke Rd	2.831	0.10	40,924	Corridor Improvement Project
10	Benjamin Pwy & Elam Ave	2.684	0.12	48,264	Corridor Improvement Project
11	Dolley Madison Rd & Friendly Ave	2.653	0.04	43,148	Possible ITS Project
12	Benjamin Pwy & Campus Dr	2.637	0.07	31,860	Remark for dual left turns
13	Fairfax Rd & Hilltop Rd	2.581	0.13	31,106	Improvements Underway
14	Aycock St & Benjamin Pwy & Westover Terr	2.570	0.07	43,224	No Project
15	Gallimore Dairy Rd & Market St	2.484	0.03	18,941	Future Project
16	Albert Pick Rd & Regional Rd	2.347	0.06	27,955	Regional Study in Progress
17	Pleasant Garden Rd & US 421 Hwy	2.296	0.05	36,976	Project on Hold
18	Wendover Ave EB Ramp & Westover Terr	2.260	0.04	33,619	No Project
19	Aycock St & Spring Garden St	2.253	0.05	62,265	Signal Modification
20	Benjamin Pwy & Cornwallis Dr	2.144	0.16	47,859	Corridor Improvement Project
21	Creek Ridge Rd & Randleman Rd	2.117	0.03	47,842	No Project
22	Friendly Ave & Jefferson Rd	2.115	0.06	41,952	No Project
23	Cone Blvd & Elm St	2.082	0.10	52,394	Project on Hold
24	Battleground Ave & Brassfield Rd	2.063	0.08	45,667	Intersection Improvement Project
25	Cornwallis & Elm St	2.000	0.03	38,394	Project on Hold

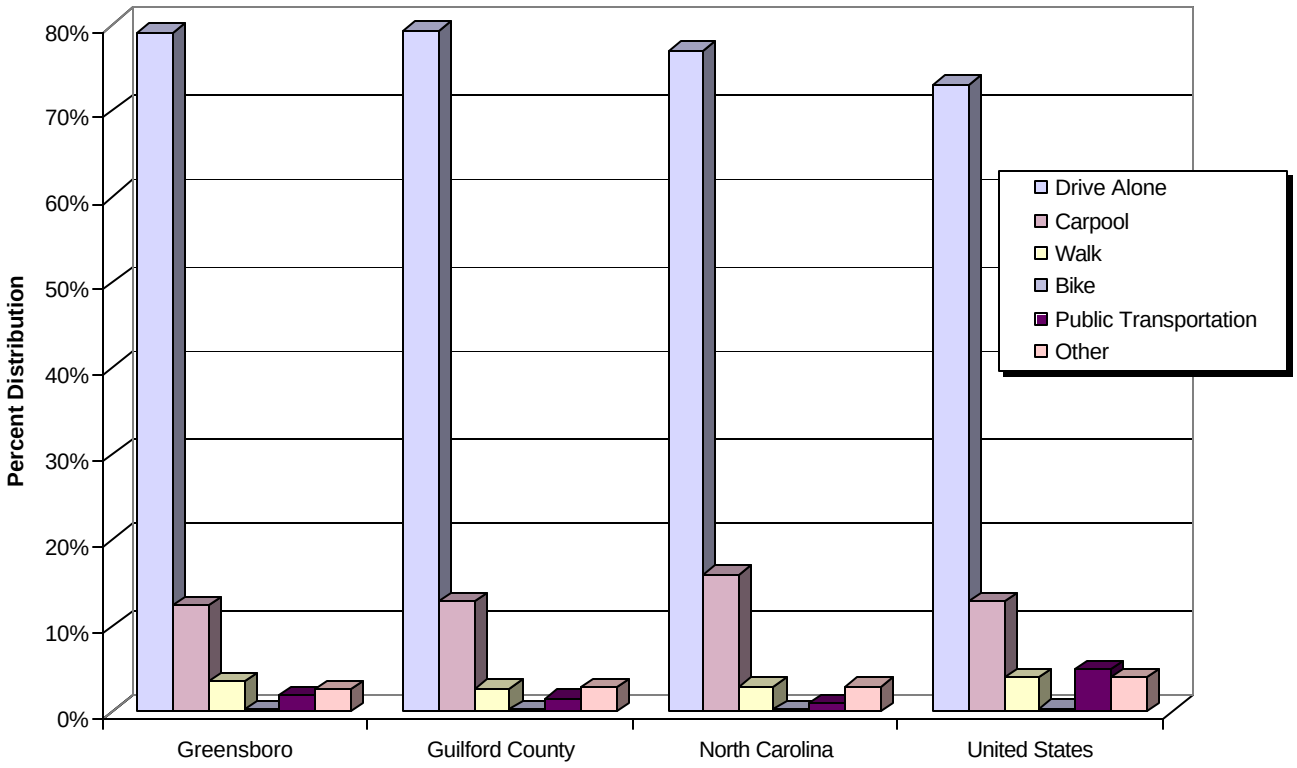
Source: Greensboro Transportation Dept., 2000. *All of these intersections are operating at a level of service F; LOS F is during AM & PM peak travel times (see glossary for definitions).

Table 9-7: Greensboro's Top Ten Congested City Thoroughfares*, 1989-1999						
Thoroughfare	From:	To:	Length (mi)	1989 Volume**	1999 Volume**	V/C Ratio
Wendover Ave.	Bridford Pkwy.	I-40	0.63	21,700	58,390	1.36
NC 68	Wendover Ave.	Market St.	4.71	11,300	46,865	1.30
Airport Pkwy.	N.C. 68	Old Oak Ridge Rd.	2.42	8,791	35,550	1.10
Battleground Ave.	Wendover Ave.	Benjamin Pkwy.	0.53	21,700	45,700	1.40
Wendover Ave.	Guilford Coll. Rd.	Bridford Pkwy.	1.07	17,500	39,450	1.26
Wendover Ave.	I-40	Spring Garden St.	1.93	39,400	60,100	1.23
Battleground Ave.	New Garden Rd.	Westridge Rd.	0.94	24,100	43,000	1.35
Wendover Ave.	Battleground	Church St.	1.38	56,300	74,300	1.42
Aycock St.	Lee St.	Benjamin Pkwy.	1.30	16,300	34,000	1.14
Spring Garden St.	Wendover Ave.	Market St.	0.71	22,700	40,280	1.31
Source: Greensboro Transportation Dept., 2000. *LOS is F for all 10 during AM & PM peak travel times (see glossary for definitions). **Volume is cars per day.						

Table 9-8: Top Congested Interstate Thoroughfares in Greensboro, 1989-1999						
Thoroughfare	From:	To:	Length (mi)	1989 Volume*	1999 Volume*	V/C Ratio
I-40	Sandy Ridge Rd.	High Point Rd.	9.26	78,000	98,000	1.30
I-85	I-40	US-29	3.31	106,000	144,000	1.32
Source: Greensboro Transportation Dept., 2000. Note: LOS is F for all 10 during AM & PM peak travel times (see glossary for definitions). *Volume is cars per day.						

Table 9-9: Transportation Mode Share Comparisons in Selected Areas, 1990							
	Mode						
Area	Drive Alone	Carpool	Walk	Bike	Public Transit	Other	Total
Greensboro	79.1%	12.5%	3.6%	0.3%	1.9%	2.6%	100%
Guilford County	79.4%	13.0%	2.8%	0.3%	1.6%	2.9%	100%
North Carolina	77.0%	16.0%	3.0%	0.3%	1.0%	3.0%	100%
United States	73.0%	13.0%	4.0%	0.4%	5.0%	4.0%	100%
Source: US Census Bureau, 1990 Census of Population & Housing, Journey to Work.							

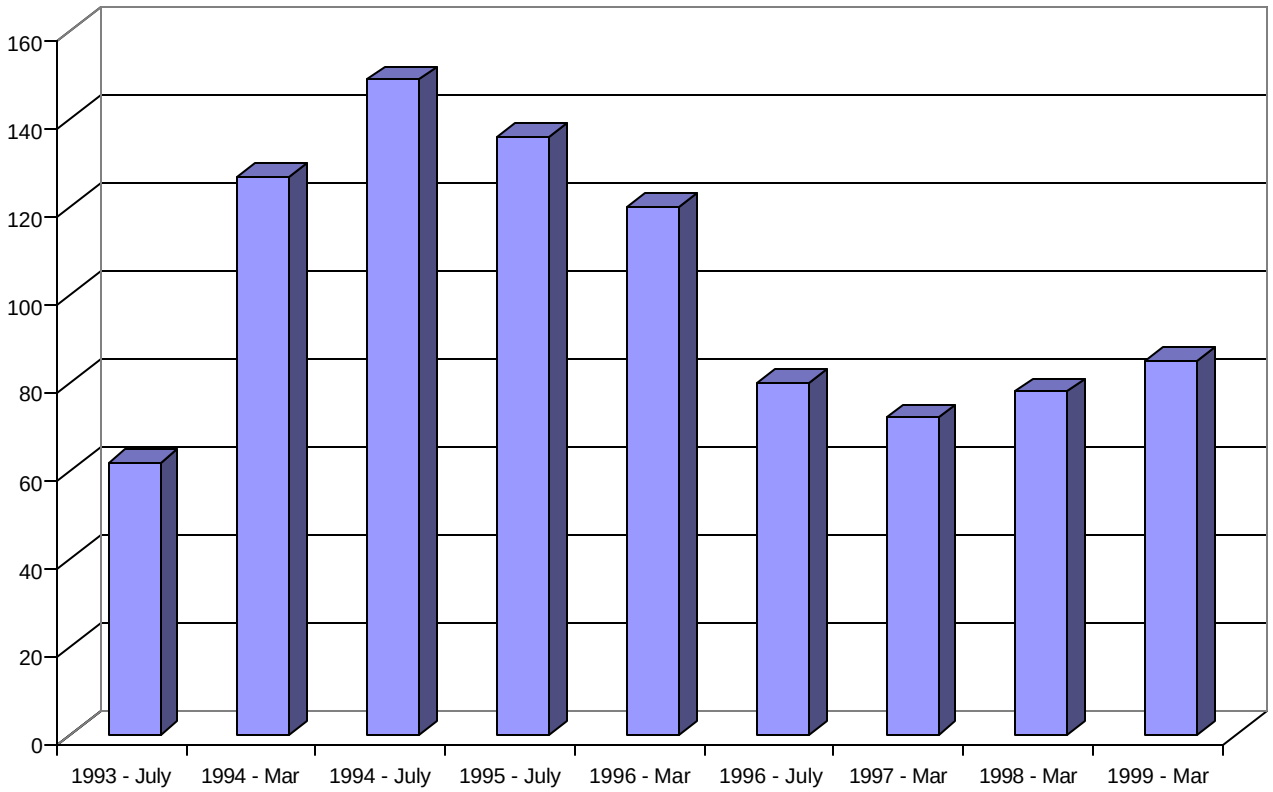
Figure 9-4: Transportation Mode Share Comparisons in Selected Areas, 1990



Source: US Census Bureau, 1990 Census of Population & Housing, Journey to Work.

Table 9-10: PTIA, Average Number of Flights Per Day, 1993-1999	
Date	Average Flights
1993 - July	62
1994 - Mar	127
1994 - July	149
1995 - July	136
1996 - Mar	120
1996 - July	80
1997 - Mar	72
1998 - Mar	78
1999 - Mar	85
Source: Piedmont Triad Council of Governments, 2001.	

Figure 9-5: PTIA, Numbers of Flights, 1993-1999

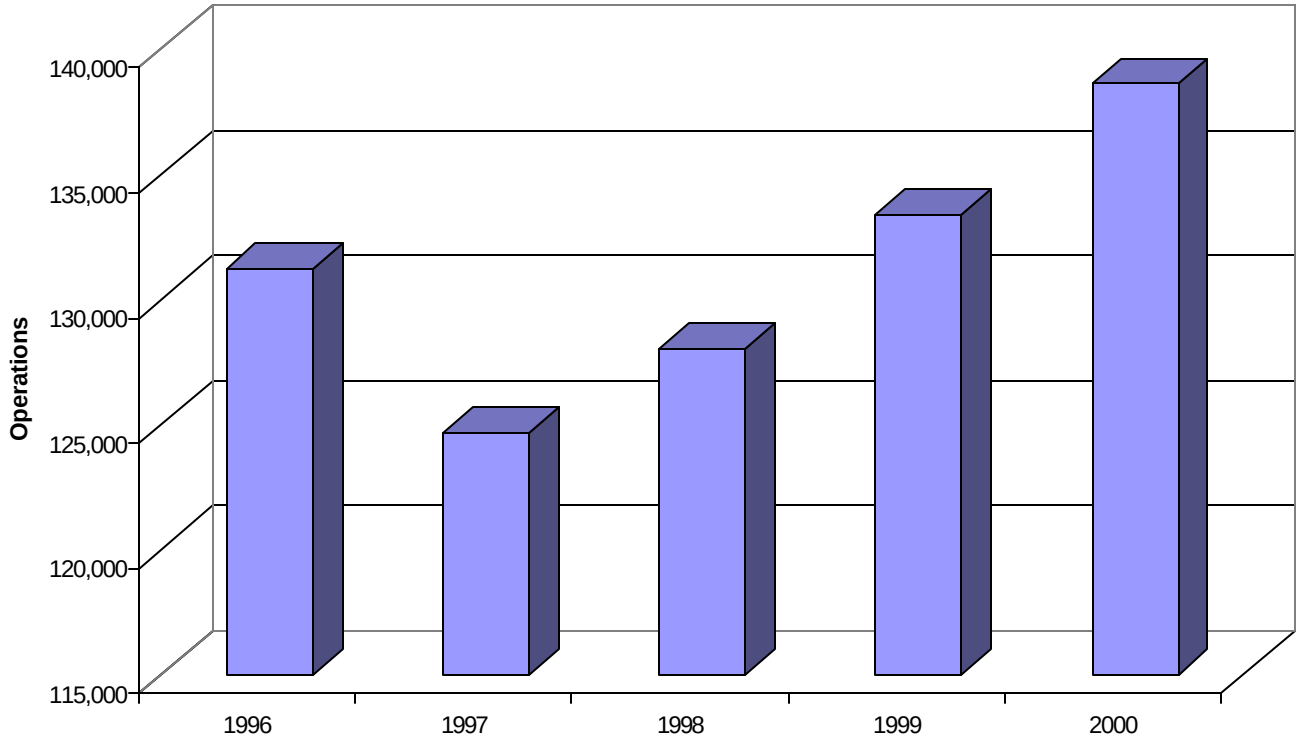


Source: Piedmont Triad Council of Governments, 2001.

Table 9-11: Piedmont Triad International Airport Statistics, 1996-2000						
Services	1996	1997	1998	1999	2000	1996-2000 Percent Growth
Aircraft Operations						
Total Aircraft Operations*	131,227	124,689	128,028	133,398	138,641	5.3%
Air Carrier Enplaned** Traffic						
Passengers (All Services)	1,299,502	1,119,987	1,304,978	1,351,622	1,396,766	7.0%
Total Cargo (lbs.)***	79,084,323	100,772,080	102,895,301	81,769,238	73,546,624	-7.5%

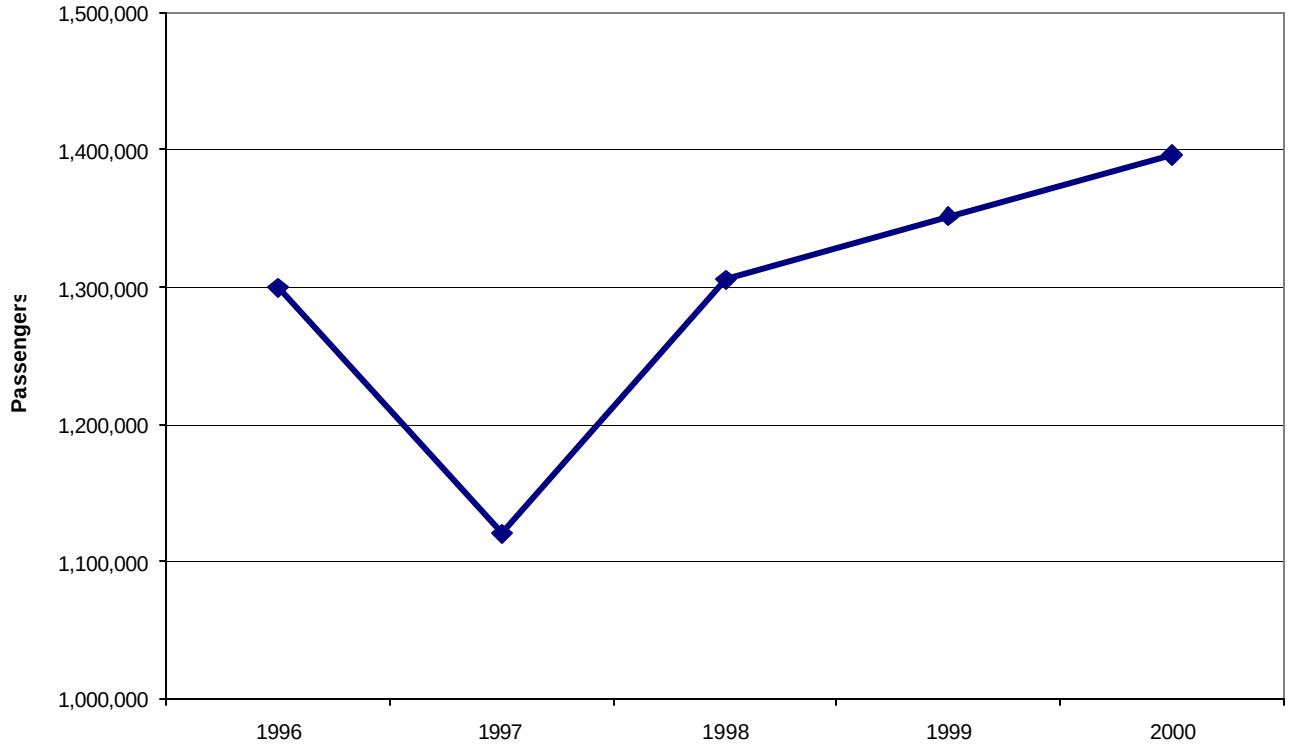
Source: Piedmont Triad Airport Authority, Statistical Data Report, 1996-2000. *Aircraft Operations - commercial air carrier, air taxi, general aviation & military. **Defined as Passenger; A.C.E.T. is counted for take-offs only. ***Cargo - US mail & express/ freight. Note: the 1997 drop in Total Aircraft Operations is due to General Aviation (Local & Itinerant).

Figure 9-6: Piedmont Triad International Airport Total Aircraft Operations*, 1996-2000



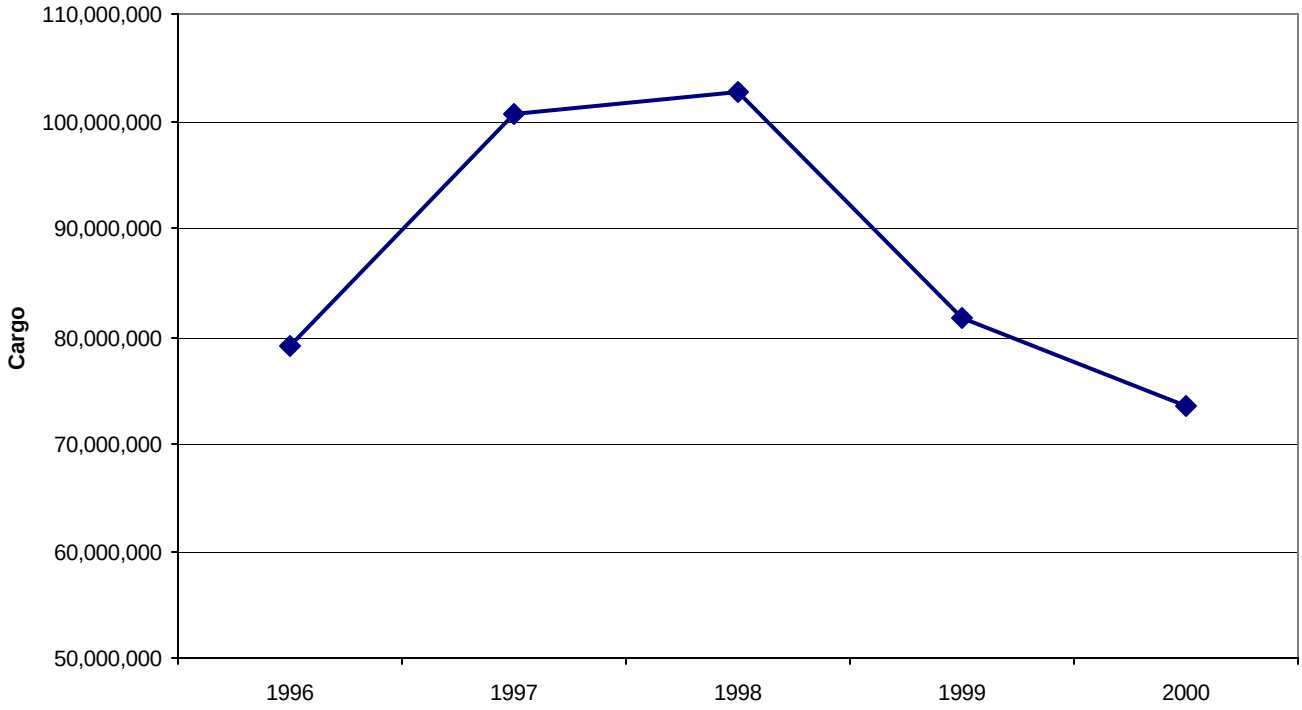
Source: Piedmont Triad Airport Authority, Statistical Data Report, 1996-2000. *Aircraft Operations - commercial air carrier, air taxi, general aviation & military. Note: the 1997 drop in Total Aircraft Operations is due to General Aviation (Local & Itinerant).

Figure 9-7: Piedmont Triad International Airport Passengers (All Services), 1996-2000



Source: Piedmont Triad Airport Authority, Statistical Data Report, 1996-2000.

Figure 9-8: Piedmont Triad International Airport Total Cargo (lbs.)*, 1996-2000**



Source: Piedmont Triad Airport Authority, Statistical Data Report, 1996-2000. ***Cargo - US mail & express/ freight.